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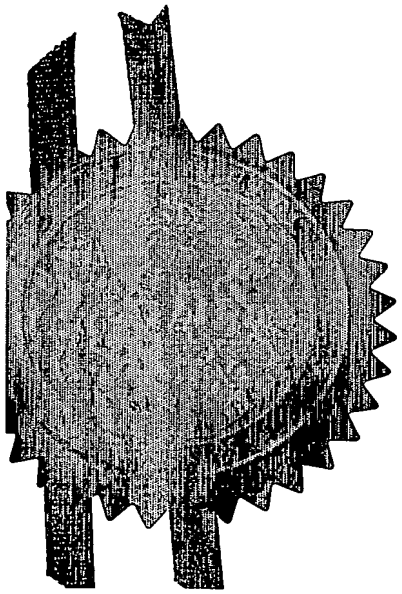

Signed

Dated 28 August 2003

Patents Form 1/77

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The Patent Office

1/77

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

THE PATENT OFFICE
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29 AUG 2002
NEWPORT

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Cardiff Road
Newport
Gwent NP9 1RH

1. Your reference — 11035P3-GB/AK

2. Patent application number *(The Patent Office will fill)* — 0220023.6

29 AUG 2002

29AUG02 E744369-1 D02903
P01/7700 0.00-0220023.6

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

Reckitt Benckiser Inc
1655 Valley Road
Wayne
New Jersey 07474
UNITED STATES OF AMERICA

Patents ADP number *(if you know it)* — 07852247001

If the applicant is a corporate body, give the country/state of its incorporation — Delaware

4. Title of the invention — Improvements In and To Dispensing Devices

5. Name of your agent *(if you have one)*

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

John Crawford McKnight
Reckitt Benckiser plc
Group Patents Department
Dansom Lane
HULL
HU8 7DS
UNITED KINGDOM

Patents ADP number *(if you know it)* — 07799521001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application *(day / month / year)*	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*

a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
See note (d))

Yes

Patents Form 1/77

4. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form	
Description	4
Claim(s)	2
Abstract	1
Drawing(s)	4

10. If you are also filing any of the following, state how many against each item.

Priority documents	
Translations of priority documents	
Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	
Request for preliminary examination and search *(Patents Form 9/77)*	One
Request for substantive examination *(Patents Form 10/77)*	One
Any other documents *(please specify)*	FS2

11. I/We request the grant of a patent on the basis of this application.

Signature: Graf-Brown & Co

Date: 23 August 2002

John C McKnight

12. Name and daytime telephone number of Person to contact in the United Kingdom: John C McKnight (01482) 583719

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IMPROVEMENTS IN AND TO DISPENSING DEVICES

This invention relates to an actuator button for use on an aerosol spray container to deliver an atomized spray of liquid such as an air freshener and to the dies by which such an actuator button is made.

Aerosol actuator buttons are well known in the art and are used to atomize a pressurized liquid into a spray which can be delivered into a room or to coat an object with the atomized spray. A variety of different types and examples of actuator buttons are disclosed in United States Patent No. 4,805,839 to S. C. Johnson & Son, Inc. The actuator button disclosed in United States Patent No. 4,805,839 diverts its spray away from the user by having an asymmetrical conical depression in the bottom of the button where the configuration of the conical depression causes the liquid escaping from the orifice to be tilted away from the central long axis of the cavity which receives the free end of an aerosol valve so that the central long axis of the aerosol spray pattern is tilted away from the central long axis of the cavity at a preselected angle.

Such an arrangement and tilting of the aerosol spray pattern can have a negative effect on the delivery and quality of aerosol product into the area which is being treated by the aerosol. The delivery and quality of aerosol product is dependent upon the atomization of the liquid which is being delivered as an aerosol through the actuator. The finer the particle size of atomization, the longer the fragrance, or other material to be delivered, will stay in the room atmosphere as well as providing for a larger area of coverage due to the diffusion of the fragrance, or other material, out of the particles.

Another arrangement is found in United States Patent No. 5,263,616 to Abplanalp which shows an aerosol actuating cap with side mounted hinges for use with an aerosol container having a tilt valve.

With that background, the present invention provides for an actuator button which provides better atomization of liquid into the air. In addition, with the spray being dispensed along the central long axis, the user will have better control over dispensing the aerosol without having to remember the angle at which the actuator button of United States Patent No. 4,805,839 is positioned.

The present invention provides an overcap for an aerosol container comprising a wall capable of being attached to the container, a button having an actuating means and a cavity in the bottom thereof adapted to sealingly receive the free end of an aerosol valve stem having a hollow bore which is in flow communication with an orifice in the top of said body for releasing a pressurized liquid to be atomized, said orifice being coaxial with the central long axis of said cavity and bore, and at least two hinges attaching the button to the wall, such that the configuration of the hinges causes the liquid escaping from the orifice to be dispensed along the central long axis of the cavity as it is atomized into an aerosol spray pattern. The hinges can be torsion hinges and can be present in two, three or more.

It is a further object of the present invention to provide a set of dies for molding the spray aerosol actuator buttons of the present invention.

A. a male die for forming at least the cavity portion of the button and having a first upper surface, coaxial with the central long axis of the cavity, for forming the portion of the cavity closest to said orifice and
B. at least one other die for forming the remainder of said button, including said orifice, wherein any one of such dies has a cylindrical extension which is coaxial with the central long axis of said cavity and having a flat surface for contact with the first surface of said male die to form said orifice when the dies are brought together coaxial with the central long axis of the first upper surface of the male die and the flat surface of said other die to form said button, said orifice being coaxial with respect to said central long axis of the die forming the cavity. The dies can be made of conventional metals used in molding dies such as H13 and S7 type steels, oil-hardened tool steels, air-hardened tool steels, aluminum and the like.

The following is a brief description of the drawings showing an embodiment of the present invention:

Fig. 1 is a perspective view of an overcap taken from the top rear.

Fig. 2 is a bottom plan view.

Fig. 3 is a perspective view of the overcap taken from the bottom.

Fig. 4 is a cross-sectional view of the overcap of Fig. 1, taken along section lines A-A.

Referring to the drawings, Figs. 1 and 2 show one embodiment of the overcap of the present invention. Overcap 2 is can be fixed on a conventional pressurized aerosol container (not shown). Overcap 2 is composed of a wall 4 and aerosol actuator button 6 which is joined to outer shell 4 by means of a plastic hinging strip 8. Button 6 contains an actuating means in the form of a depressed finger pad 10 having a number of raised ridges 12. Button 6 also contains an orifice 14 where aerosolized fluid is discharged. Also shown is tamper evident tab 16, which is optional, which connects button 6 to inside rim 15 of wall 4 during manufacture of the overcap. After the first use, tab 16 is no longer connected to rim 15 and the user can then tell if the overcap has been used.

In Figs. 2 and 3, chords 42 protrude from the inner surface of wall 4 near the bottom of the wall. When overcap 2 is mounted onto an aerosol container, chords 42 engage a bead on the container (not shown but understood by those skilled in the art) to prevent the overcap from sliding off the container. However, other methods of attaching the overcap to the container would be understood by those skilled in the art. Ribs 40 are preferably mounted on the inner surface of wall 4. Ribs 40 comprise flanges protruding radially inward, extending from a point near the bottom of the wall, but above chords 42, upward toward the bottom 50 of the cap. Sufficient space is provided between the bottom of ribs 40 and the chords 42 to accommodate a bead from a container. The ribs give added strength to the overcap and prevent the overcap from sliding too far down on the container to which it is attached.

Fig. 3 shows a perspective view of cap 2 from the bottom. Tubular extension 18 has cavity 20 which runs through the entire extension 18 and is in fluid communication with orifice 14. At its lower end, cavity 20 has a wider portion 26 (shown in Fig. 4) which sealingly engages the outside of a conventional tubular valve stem (the valve stem which is part of a valve assembly connected to a pressurized can; not shown). The valve stem has a central hollow bore which is in flow communication with cavity 20 and the pressurized liquid in the container. Orifice 14,

cavity 20, and the bore hole of the valve stem are all co-axial with the central long axis 30 of button 6.

Thus in practice, pressurized liquid passes through the hollow valve stem bore when finger pad 10 is depressed and travels under pressure through cavity 20 and through orifice 14 where it contacts the atmosphere and the pressurized liquid is then aerosolized into fine droplets in the atmosphere.

Actuator buttons of the present invention can therefore be used in any application where an aerosol is used to deliver a useful liquid composition, such as in air freshener delivery containers, carpet and other fabric care applications, and insecticide or germicide dispensing in the form of aerosol sprays. Any of the commonly used plastic materials for aerosol buttons and overcaps such as high density polyethylene as well as polypropylene can be employed. Other modifications and variations of the buttons and dies of the present invention will become apparent to those skilled in the art from the examination of the above specification and drawings. Thus, other variations of the spray actuator button and dies for making the same may be made which fall within the scope of the appended claims, even though such variations were not specifically discussed above.

Claims:

1. An overcap for an aerosol container comprising a wall capable of being attached to the container, a button having an actuating means and a cavity in the bottom thereof adapted to sealingly receive the free end of an aerosol valve stem having a hollow bore which is in flow communication with an orifice in the top of said body for releasing a pressurized liquid to be atomized, said orifice being coaxial with the central long axis of said cavity and bore, and at least two hinges attaching the button to the wall, such that the configuration of the hinges causes the liquid escaping from the orifice to be dispensed along the central long axis of the cavity as it is atomized into an aerosol spray pattern.

2. The overcap of claim 1 wherein there are two hinges.

3. The overcap of claim 1 wherein there are three hinges.

4. The overcap of claims 1 to 3 wherein the hinges are torsion hinges.

5. An overcap for an aerosol container comprising a wall capable of being attached to the container, a button having an actuating means and a cavity in the bottom thereof adapted to sealingly receive the free end of an aerosol valve stem having a hollow bore which is in flow communication with an orifice in the top of said body for releasing a pressurized liquid to be atomized, said orifice being coaxial with the central long axis of said cavity and bore, and three hinges attaching the button to the wall, such that the configuration of the hinges causes the liquid escaping from the orifice to be dispensed along the central long axis of the cavity as it is atomized into an aerosol spray pattern.

6. The overcap of claim 5 wherein the hinges are torsion hinges.

7. An overcap for an aerosol container comprising a wall capable of being attached to the container, a button having an actuating means and a cavity in the bottom thereof adapted to sealingly receive the free end of an aerosol valve stem having a hollow bore which is in flow communication with an orifice in the top of said body for releasing a pressurized liquid to be

atomized, said orifice being coaxial with the central long axis of said cavity and bore, and at least two torsion hinges attaching the button to the wall, such that the configuration of the hinges causes the liquid escaping from the orifice to be dispensed along the central long axis of the cavity as it is atomized into an aerosol spray pattern.

8. The overcap of claim 7 wherein there are three torsion hinges.

9. An overcap for an aerosol container comprising a wall capable of being attached to the container, a button having an actuating means and a cavity in the bottom thereof adapted to sealingly receive the free end of an aerosol valve stem having a hollow bore which is in flow communication with an orifice in the top of said body for releasing a pressurized liquid to be atomized, said orifice being coaxial with the central long axis of said cavity and bore, and three torsion hinges attaching the button to the wall, such that the configuration of the hinges causes the liquid escaping from the orifice to be dispensed along the central long axis of the cavity as it is atomized into an aerosol spray pattern.

Abstract

IMPROVEMENTS IN AND TO DISPENSING DEVICES

Disclosed is an aerosol actuator button for delivering a liquid from a pressurized aerosol container wherein the dispensed liquid is along the central long axis of the actuator button and container.

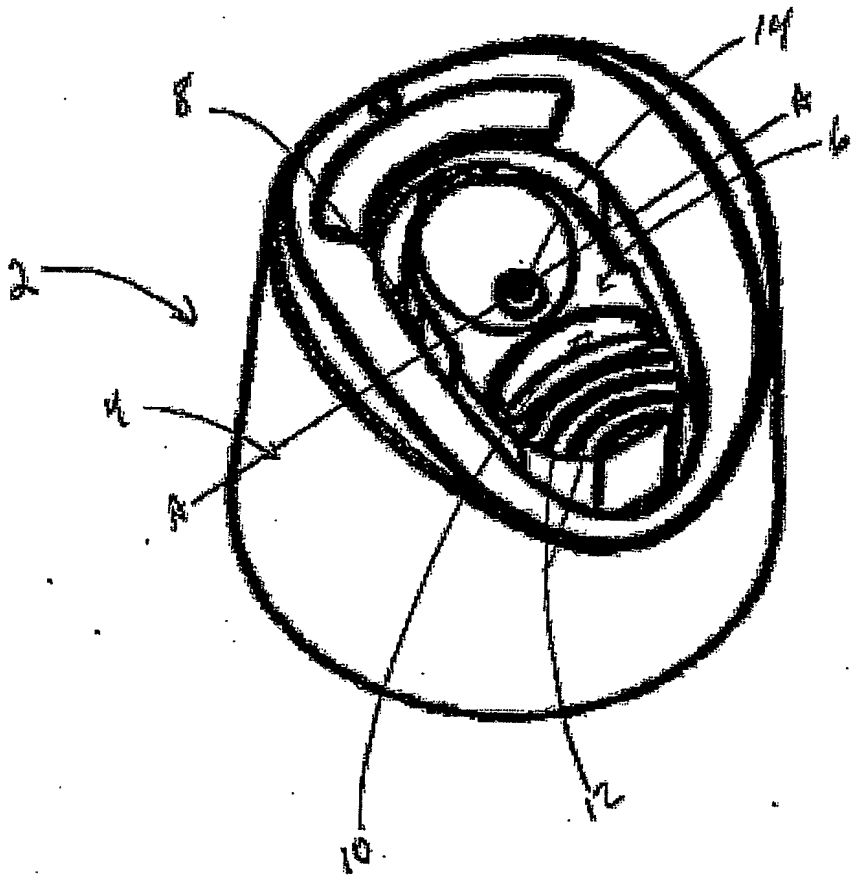

Fig. 1

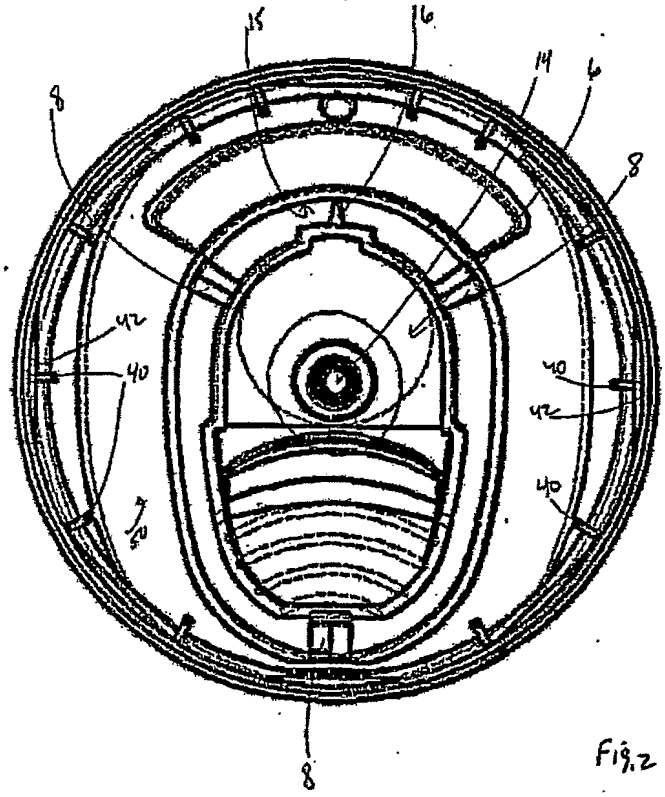

Fig. 2

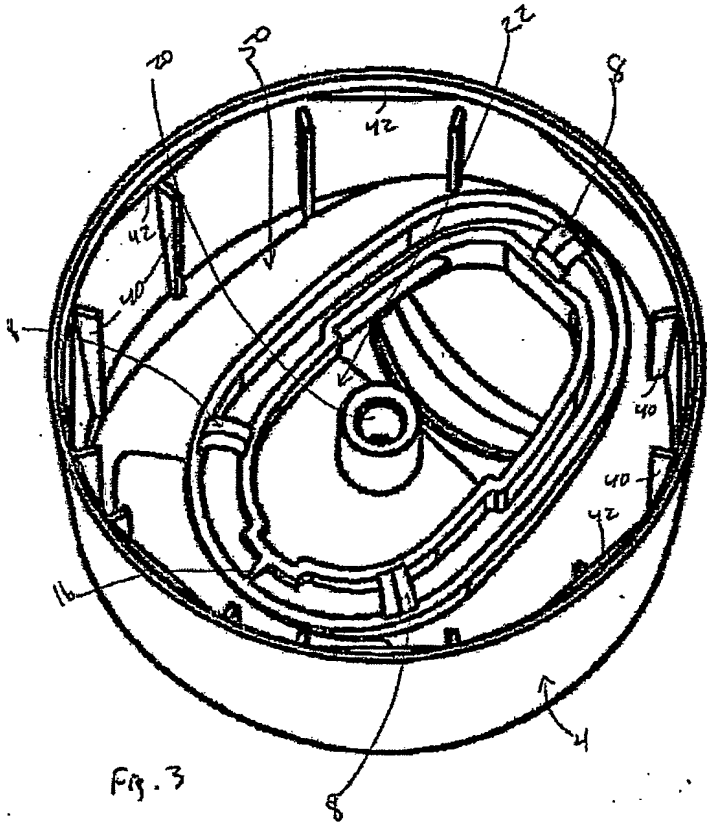

Fig. 3

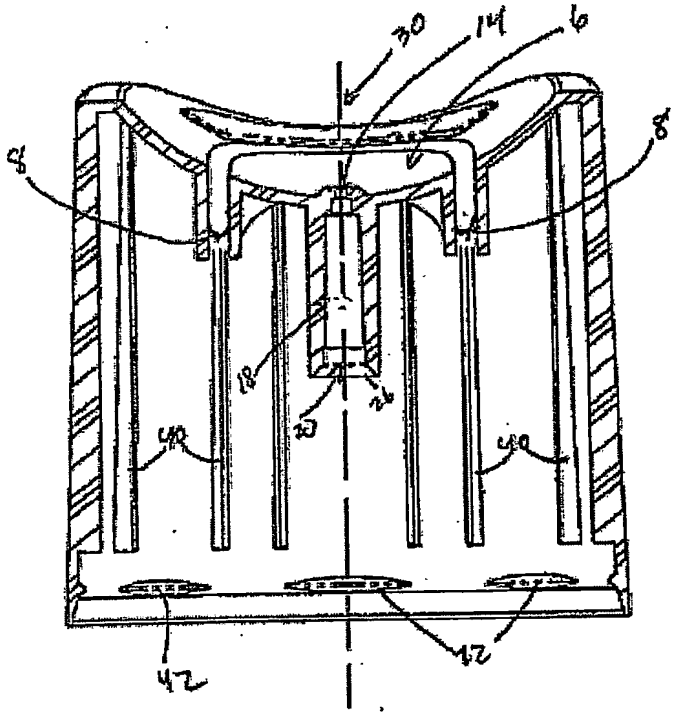

FIG.4